SCIENTIFIC SERIALS

Journal of the Franklin Institute, September. This number opens with numerous editorial notes, principally abstracts from other scientific journals; there is also the commencement of a description of the Stevens Institute of Technology in Hoboken. Amongst the notes we notice an account of Grubb's automatic spectroscope, and a description of the properties of Nitroglycerine as found by M. Champion. It is stated that when pure it may be heated up to 200° without explosion, but at 257° it deflagrates violently; and although it explodes with terrific force by a blow, the electric spark does not affect it. A number of original communications follow. Under the head of Civil and Mechanical Engineering, we find a paper containing some useful "formulæ, rules, and examples for cases of earth-work under warped and plain surfaces," and another "On Descriptions of Wood-working Machinery." Under mechanics, physics, and chemistry, there is a paper "On Apparatus Illustrating Mechanical Principles;" the various pieces of apparatus are intended to show experimentally the truth of problems, such as the parallelogram of forces, the parallelopipedon of forces, and so on; a machine is also described to illustrate the action of the forces of gravity and projection in giving a projectile its parabolic trajectory. They are designed by J. Pemberton, and seem to be well adapted to the various purposes which have hitherto been neglected. The continuation of a lecture on the sun by Dr. Gould follows; he deals shortly with the prismatic analysis of light and with the solar spectrum, explaining the curves of thermal, luminous, and chemical intensity. Prof. Leeds contributes a valuable paper for the use of students "On the Measurement of the Angles of Crystals," and Mr. Coleman Sellers reviews Mr. Crookes's Experimental Investigation of a New Force; he boldly states that he believes Mr. Crookes has been deceived, giving several reasons why he is of this opinion. An editorial note is attached to this paper, stating that Mr. Sellers is very accomplished in the field of legerdemain, which would lend peculiar value to his view.

Journal of the Franklin Institute, October. The editorial notes contain several valuable abstracts, amongst which may be noticed one on Fluorescence, originally published by E. Lommel in the "Repert. der Physik." From his observations Lommel shows that Stokes's law "that the refrangibility of the exciting rays is always the upper limit of the refrangibility of the excited rays" does not always hold good, and also that the very common opinion that Fluorescence is an action by which refrangible rays are converted into less refrangible rays is not altogether true.—Prof. Thurston communicates a report "On a Steam Boiler Explosion," to which is added a clear statement of many of the causes of such explosions. Prof. Heines contributes the first of a series of papers on binocular vision; he deals shortly with the human eye and monocular vision, and then proceeds to some phenomena of binocular vision. The last paper was read before the American Association for the advancement of Science by Prof. Owen, "On Physiographic and Dynamical Geology involving the discussion of Terrestrial Magnetism," in which it is thought probable that the sun is the source of the modifications on the earth, giving the form and dimensions to the land, and that magnetism, either directly or by conversion into chemical force, has been the most powerful agent in causing various natural phenomena, such as the geysers, volcanoes, ocean currents, &c.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, December 7.—"On the Fossil Mammals of Australia. Part VI. Genus *Phascolomys*, Geoffr."—By Prof. Owen, F.R.S. In this paper the author premises a reference to former ones on the Osteology of existing *Marsupialia*, in the "Transactions of the Zoological Society," and to his "Catalogue of the Osteological Series in the Museum of the Royal College of Surgeons," in which are defined cranial characters serving to distinguish existing species of the genus *Phascolomys*, Geoffr.; and after showing, in subsequently received materials, the kind and extent of variety of such characters in the same species, he proceeds to apply the knowledge so gained to the determination of some fossil remains of species of Wombat, similar in size to the known existing kinds. The extinct *Phascolomys Mitchelli*, indicated by remains brought to England in 1835 by Sir Thomas Mitchell, C.B., the discoverer of the bone-caves of Wellington Valley, Australia, is determined by specimens subsequently obtained by Prof. Alex. M. Thomson and Mr. Gerard Krefft, from the same caves. A second species, distinguished by characters of the nasal bones, is called after its discoverer *Phascolomys Krefftii*. Modifications of the lachrymal, maxillary, and palatal bones in the existing kinds of Wombat are also applied to the determination of the fossils: specimens from the fresh water deposits of Queensland are thus shown to belong to the species *Phascolomys Mitchelli*, originally founded on fossils from the breccia-caves of New South Wales. The author next proceeds to point out the characters of the mandible in existing Wombats, available in the determination of extinct species of *Phascolomys*. On this basis he defines specimens which he provisionally refers to his *Phascolomys Krefftii*. He then points out the mandibular characters of *Phascolomys Mitchelli*, and shows that the existing *Phascolomys latifrons* was represented by mandibular fossils from the breccia-caves of Wellington Valley. Proceeding next to the description of fossil mandibular remains of the genus *Phascolomys* from the fresh water deposits of Queensland, the author defines *Phascolomys Thomsoni*, *Phasc. platyrhinus*, and *Phasc. parvus*. The latter, seemingly extinct, species is markedly inferior in size to any of the known existing species. An account of the extinct kinds of Wombat, exceeding in size the existing species, will be the subject of a succeeding communication. The present is illustrated by subjects occupying seven plates and eight woodcuts, all the figures being from nature, and of the natural size.

"On Fluoride of Silver. Part III." By G. Gore, F.R.S.

"On the Solvent Power of Liquid Cyanogen." By G. Gore, F.R.S.

Zoological Society, December 5.—John Gould, F.R.S., V.P., in the chair.—The Secretary read a report on the additions that had been made to the Society's Menagerie during the months of October and November 1871, and called particular attention to a young female specimen of the Cape Fur-Seal (*Otaria pusilla*), presented by Sir Henry Barkly, Governor of the Cape Colony, being the first example of this interesting animal received alive in Europe.—A letter was read from Dr. Burmeister, of Buenos Ayres, containing remarks on Messrs. Sclater and Salvin's "Synopsis of the Cracidæ," published in the Society's "Proceedings" for 1870.—Dr. E. Hamilton exhibited and made some remarks on an adult skull of the newly-discovered Chinese Deer (*Hydropotes inermis*), and compared it with an immature skull of the same species exhibited by Mr. R. Swinhoe at a meeting of the Society, February 10, 1870. Dr. Hamilton also drew attention to the statement made by his correspondent respecting the wonderful fecundity of this animal, which tended to corroborate the facts stated by Mr. Swinhoe on that occasion.—Mr. Sclater exhibited and remarked on a skin of the Water Opossum (*Chironectes variegatus*), which had been sent to him by Mr. Robert B. White, from Medillin, United States of Columbia.—Prof. Newton exhibited and made remarks on the humerus of a Pelican (believed to be *Pelecanus crispus*), which had been found in the English fens.—A communication was read from Surgeon Francis Day, Inspector-General of Fisheries of British India, containing remarks on the fresh-water Siluroids of India and Burmah, with observations on the range of the species, their classification, and general geographical distribution.—Mr. A. G. Butler read a paper on a small collection of Butterflies made at Loanda, the capital of the Portuguese Settlements of Angola. A second paper by Mr. Butler gave the description of a new genus of Lepidoptera, allied to *Apatura*, which was proposed to be called *Eulaceüra*.—A paper by Mr. E. A. Smith was read, containing a list of species of Shells from the Slave Coast, West Africa, collected by the late Commander Knocker, R.N., the majority of which had been dredged at Whydah, on the Dahomey shore.—Prof. Newton communicated some notes by Herr Robert Collett, of Christiana, on the singular asymmetry of the skull in Tengmalm's Owl (*Strix tengmalmi*).—Mr. Sclater read the third and final portion of a series of notes on rare or little-known animals now or lately living in the Society's Gardens. Mr. Sclater gave an account of a collection of Birds from Oyapok, on the river of the same name which divides Cayenne from the northern frontier of Brazil, amongst which were two species believed to be undescribed, and proposed to be called *Ochthoëca murina* and *Heteropelma igniceps*. A third communication from Mr. Sclater contained remarks on the species of the genera *Myiozetetes* and *Conopias*, belonging to the family Tyrannidæ.—Mr. E. W. H. Holdsworth read some notes on the Red-spotted Cat (*Felis rubiginosa*) of

Ceylon, and its varieties.—Mr. D. G. Elliot read a paper on various Felidæ, rectifying the synonymy of several species, and giving a more perfect description of one recently obtained from North-West Siberia, which he proposed to call *Felis euptilura*. Dr. Günther made a reply to some critical remarks in a paper by Surgeon Francis Day, read at a recent meeting of the Society.

Geologists' Association, December 1.—The Rev. Thomas Wiltshire, M.A., F.G.S., president, in the chair.—"On the Glacial Drifts of North London," by Mr. Henry Walker. These drifts were described under the classification and nomenclature given to the glacial deposits by Mr. Searles V. Wood, jun. They were traced from East End (Highgate) and Muswell Hill to Finchley, Colney Hatch Lane, and Whetstone. The profusion of chalk found in the glacial clay at these places bears out the designation of the main deposit in south-eastern England as the great Chalk Boulder Clay; but it is also found that the sands and gravels of the Middle Glacial, which Mr. Wood seems to restrict to a much lower horizon than Finchley, are also to be found at these localities. At Whetstone the Chalky Boulder Clay is found overlying twenty-five feet of gravel and sand, and in the apparently corresponding beds at Finchley and Hendon Lane, drift fossils and casts are occasionally found. Mr. Henry Hicks agreed with the conclusion that these sands and gravels are Mr. Wood's Middle Glacial. Mr. Caleb Evans thought that the heights to the north of London marked the southern termination of the glacial drift. Mr. Batt considered that the Drift had extended to the country south of the Thames. Several other gentlemen took part in a very animated discussion.—Collections of fossils and boulders from the Middlesex Drift were exhibited, and a quantity of peat obtained from the same source, was shown by Mr. J. T. B. Ives.

Society of Biblical Archæology, December 5.—Prof. Donaldson, B.A., F.R.S., in the chair. A paper by the Chev. de Saulcy, membre de l'Institut, "On the true sites of Capernaum, Chorazin, and Bethsaida (Julius)" was read by the secretary. In the chevalier's paper, which took the form of a letter (addressed to the Dean of Westminster), he stated that, having considered the whole tenor of the argument first advanced by him in the *Revue Archæologique* twenty years ago, he could come to no other conclusion than that the traditional town of Bethsaida and the identification of Kerâzeh as Chorazin and Tel Houm as Capernaum were unsupported by geographical evidence, and were contrary to the express statements of Josephus, who would be sufficiently exact in describing the town where he was wounded. At the same time the ruins of Kerâzeh were too extensive to be those of insignificant village like Chorazin; and those of suppositious Bethsaida were too few, and contained no indications of the Family Mausoleum of Herod Philip. The conclusion of the author was that Tel Houm was more probably the real site of Capernaum. A considerable amount of philological evidence illustrated these statements. On the close of the reading of this paper an interesting discussion ensued, in which the chairman and the following gentlemen took part:—Mr. W. R. A. Boyle, Dr. Cull, Mr. S. M. Drach, Mr. John Macgregor, and Captain Wilson.

Entomological Society, December 4.—A. R. Wallace, president, in the chair.—Mr. Shearwood exhibited an extraordinary variety of *Argynnis aglaia*, taken at Teignmouth. Mr. Bond exhibited varieties, or malformations, of various British *Lepidoptera*.—Mr. Janson exhibited a large collection of insects (chiefly *Coleoptera*) from the diamond fields of South Africa. —Mr. Higgins exhibited examples of *Tetracha crucigera* of MacLeay, from Australia.—Prof. Westwood made some remarks concerning *Papilio Thersander*, figured by Donovan, and arrived at the conclusion that this species (figured originally by Jones in his "Icones") was founded on the combination of a *Papilio* with *Charaxes Fabius*. A discussion ensued concerning the right of named figures of insects, by the older authors, to be regarded in questions of priority.—With reference to the question of the liability of large dragon-fles to the attacks of birds, Mr. Müller called attention to a statement by Natterer, to the effect that some species of *Falconidæ* habitually prey upon dragon-flies. Mr. Horne stated that during his residence in India he had never seen those insects attacked by birds of any description.—Major Parry communicated notes concerning *Lissapterus Howittanus*, and Mr. W. F. Kirby on the synonymy of various Lepidoptera.

Linnean Society, December 7.—Mr. G. Bentham, president, in the chair. "On the formation of British Pearls and their possible improvement," by R. Garner. The author referred to the theory, now generally adopted, that the production of pearls in oysters and other mollusks is caused by the irritation produced by the attacks of the minute parasite known as *Distoma*, and believed that, by artificial means, this parasite might be greatly increased. British pearls are obtained mostly from species of *Unio*, *Anodon*, and *Mytilis*, but it is probable that all mollusks, whether bivalve or univalve, with a nacreous lining to the shell, might be made to produce pearls. An interesting discussion followed, in which Mr. Gwyn Jeffreys, Mr. Holdsworth, and Dr. Murie took part.—"On certain Coleopterous Larvæ," by Dr. Burmeister, of Buenos Ayres.—"On the Botany of the Speke and Grant expedition," by Lieutenant-Colonel Grant. Notwithstanding the difficulties of their journey, and that they had more than once to destroy or abandon their whole collection, Captain Speke and Captain Grant succeeded in bringing home between 700 and 800 species of plants, many of them entirely new, which have been described by Prof. Oliver, and will be published in the "Transactions" of the Society, with at least 100 plates.

Anthropological Institute, December 4.—Sir John Lubbock, Bart., president, in the chair.—Messrs. J. Cordy Burrows, J. Park Harrison, and P. C. Sutherland were elected members. Captain Richard F. Burton read his second paper on "Anthropological Collections from the Holy Land." The paper included a *catalogue raisonné* of articles presented to the museum of the institute, found by Mr. John S. Rattray at Sáhib El Zamán (Lord of the Age), the reputed tomb of Hezekiah. This "find" consisted of fragments of human skulls and long bones, old copper bracelets, brass bracelets, coins, bits of lachrymatories (the glass being highly iridescent), portions of Syrian majolica of the type of that usually made at Damascus by the Tartars, beads of various kinds, &c. The tomb was situated in a hollow on the Eastern slope of the Libanus, and proved to be an artificial cavern, with a shaft for ventilation. A full detailed description of this very interesting discovery was given. Another interesting discovery made by Captain Burton was at the upland village of Ma'alulah, distant three hours from the large convent Saidnáyá, roughly speaking N.E. of Damascus, and occupying a position on the N.E. ranges of the Anti-Libanus. This find consisted of various fragments of skulls and lower jaws, which, together with the human remains from the tomb at Sáhib El Zamán, were described by Dr. Carter Blake. The third part of Captain Burton's paper was occupied by an account of a series of flint and stone implements and flakes, and articles of bronze and bone found near Bethlehem. In a detailed description of these articles Mr. John Evans, F.R.S., pointed out for special notice a basaltic hammer, which differed from the usual form of similar instruments discovered in Scandinavia, in Britain, and in North America, inasmuch as in the specimen the lateral depressions were absent.—Prof. Busk, F.R.S., read a communication from the Rev. Mr. Dale on flint implements from the Cape of Good Hope, which were exhibited on the table; and Mr. F. W. Rudler, F.G.S., exhibited a stone implement of unique form, also from the Cape. The President submitted for inspection some stone implements of rare beauty from Greece.

Quekett Microscopical Club, Nov. 24.—Prof. Lionel S. Beale in the chair. A paper was read by Mr. M. C. Cooke on "The Minute Structure of Tremelloid Uredines (*Podisoma*)," in which the structure of the Tremelloid masses, commonly found on juniper bushes, was detailed, together with the results of the observations of Tulasne, Oersted, and others on the germination and development of these fungi, with a critical examination of the species described under the genera *Gymnosporangium* and *Podisoma*. It was held by the author that no good foundation existed for the constitution of two genera, since the minute structure and development of both were identical. Some conversation ensued on the phenomena of alternation of generations which these and other fungi present, and especially in cases where some of the phases of existence were presumed to be passed on different hosts. Especial reference was made to the opinions entertained by Prof. Oersted that the Podisomas were found in one state parasitic on leaves of Pomaceous trees, as Rœstelias, &c., in another stage inhabiting the branches of junipers, as Podisoma. The author of the paper did not consider that this supposed phenomenon was satisfactorily proved.

MANCHESTER

Manchester Literary and Philosophical Society, October 31.—E. W. Binney, F.R.S., president, in the chair.—

Mr. Wm. Boyd Dawkins, F.R.S., gave a short account of the discoveries in the Victoria Cave, made since the last account was published in the Transactions of the Society. The clay forming the bottom of the cave, and which hitherto had been barren, was now yielding broken fragments of bone, some of which had been gnawed by the cave-hyæna. A lower jaw of this animal was found, which indicated the presence of the characteristic Pleistocene mammalia in a part of Yorkshire in which they had not been known to have existed up to the present time. There were, therefore, three distinct groups of remains in the cave, the Romano-Celtic on the surface, the Neolithic beneath, and lastly that which has been furnished by the clay which is glacial in character. And since two feet of talus had been accumulated above the Romano-Celtic layer during the last 1,200 years, it is very probable that the accumulation of debris of precisely the same character between the Romano-Celtic and Neolithic layers, six feet in thickness, was formed in about thrice the time, or 3,600 years. If this rough estimate be accepted, and it is probably true approximately, the Neolithic occupation of the cave must date back to between 4,000 and 5,000 years ago. There is no clue to the relative antiquity of the group of remains found in the clay; but it may safely be stated to be far greater than that of the Neolithic stratum. Throughout Europe the break between the Pleistocene age represented in the cave by the bones in the clay and the Prehistoric age—the Neolithic of the cave—is so great and so full of difficulty that it cannot be gauged by any method which has hitherto been invented. Mr. Boyd Dawkins also exhibited a remarkably perfect javelin head of bronze which had been dug up in a field near Settle.—"Species viewed Mathematically," by Mr. T. S. Aldis. We have learnt that all energy is really one, whether seen in heat, constrained position, or motion. Many also believe that life is really one, whether seen in man or a toadstool. But for our part we have often felt a difficulty. Why, if all life be one, do we not see it passing through every variety of form instead of being restricted to certain well-defined types? The present paper is an attempt to explain this. Let us consider what Plato might have called the *αὐτοζωον* or complete type of animal. It consists of a certain definite number of organs, composed of a certain definite number of parts. It will also have certain aliments, location, enemies, &c., which we may call its province, necessary for its life. Thus our type animal is capable of a flux passing through all possible forms and provinces in all possible combinations. I include amongst these, of course, many arrangements necessarily absurd. To each arrangement of organs and provinces thus imagined would correspond a certain vitality or power of living in the type. I mean not merely power of individual existence, but existence as a race. The vitality is therefore a function of a large number of variables, some independent, others connected by equations of condition. It is to us quite an unknown function, but not therefore indefinite. Therefore, as in any other function of variables, certain relations amongst the variables will give maxima values of the vitality. These maxima of vitality constitute species. Vitality is not mere physical might or agility or fecundity, but compounded of all. Now for a maximum, we know that any change in the variables lessens the function. We thus see how species are stable. In the constant variation, for no being seems capable of reproducing itself exactly, all individuals have less vitality as they depart from the special type which gives the maximum of vitality, and will be choked out by those which, being nearer to the type, possess more vitality. So hybrids, intermediate between two maxima, will possess less vitality than either, and will be choked out, though the main cause of failure is that the process is like that devised by Swift's Laputan philosopher, who sawed the Whigs' and Tories' heads in half, and changing them, left each brain to settle its politics in itself. So the poor mule, with a bundle of habits, half horse and half ass, in this intestine conflict, has little power to take care of itself. Of course all maxima may not have plants or animals representing them. If there be several maxima suited for nearly the same province, the maximum of greatest intensity will choke out the others. So, too, there are probably many maxima now unoccupied, as, for instance, the thistle represented a maximum of vegetable life in South America, but till man imported the thistle to fill it up, other maxima of less intensity held the ground. In some cases possibly several maxima are closely related, and differ little in their intensity, so that slightly differing species exist together, and may in their variation pass one into the other, as perhaps in brambles and some species of St. John's wort, &c. If then the province of a species, *i.e.*, the physical geography of a country, alter, and its enemies and food with them, clearly the maximum will shift and the species change. But this is not the evolution of new species, though to a person who only notes geological evidence it appears so. For, just as in a storm the lightning shows the trees still, though really waving to and fro, so the different species in geology are probably but steps in a constant change. Such a change of course must be slow for life to follow it, for a species consists quite as much in a bundle of acquired and transmitted habits as in a certain formation of organs, and the change in habit will probably be far slower than the change in form. How then do new species arise? For we see that, if the species be a maximum of vitality, in a multitudinous progeny those nearest the type will choke out the others, and the species will be stable. Varieties will be connected with maxima of vitality in two ways. Firstly, slight differences in the province will slightly shift the maximum. Thus mountain sheep would be more agile than lowland sheep. Secondly, in such a way as this. Suppose this table a low mound, narrow though long. Then the height at any point will be a function of the distances from the north and east walls of the room. There will be one point of maximum height, but whilst a change north or south produces a great change in the altitude, one east or west will produce but little. So there will be variations in some characteristics which will produce little alteration in the whole vitality. Thus, amongst wild oxen probably no varieties without horns would exist, for they affect the vitality. Amongst protected races they do not, and so hornless varieties arise. Still these varieties are but varieties, and are not steps towards a new maximum which a gulf of lesser vitality still separates them from. Or let us consider the varieties that we try to make by select breeding. These are least of all likely to produce new species. We simply by main force depress vitality in removing individuals as far as we can from the normal type, and when the vitality is sufficiently depressed we can go no further. As for altering the province, the independent variables, so to speak, we know so little how to do it, and certainly could not do it gradually enough, that we have no chance in this way of effecting anything. How then can new species arise? Apparently in some such way as this, by what we may call the bifurcation of a maximum. If we drew a horizontal line along which the variation of the organs of an animal were expressed and the corresponding vitality were drawn by ordinates, we should get a curve we might call the vitality curve, whose maxima values would be species. As time elapses and the conditions of the earth, &c., alter, the constants, so to speak, of the curve alter, and we get our curve to vary and the maxima shift; and as the curve alters, one maximum may separate into two or more others, and thus in the lapse of time, one species may separate into two or more others. Roughly to illustrate it, suppose some species developed free from the influence of carnivora, and that, owing to various causes, size little affects its vitality, it may vary all through, from little and swift to big and heavy. Now, introducing carnivora, we can see how a bifurcation of our maximum would take place. The very light and swift would preserve themselves by their agility, the strong and heavy by their strength, whilst the intermediate would be killed out, and thus two distinct species would arise, which might in course of time by further variation separate still further apart. Doubtless, however, this bifurcation goes back to very remote times. Carnivores and herbivores probably separated not as mammals but as reptiles, or even long before, whilst ruminants and non-ruminants may have separated since they became mammals. Thus Australia seems to have possessed at one time only one marsupial, which has bifurcated into various marsupials, but not into any of another kind. The older the species grow, the deeper is the gulf between them, and, like a river, we have to ascend nearly to the source before we can make a passage from one bank to the other. To recapitulate—Maxima of vitality are species. Any alteration from the normal type produces less vitality, hence the normal type is stable. A slow change of physical geography, &c., slowly changes these maxima, and the species change with them, extinct species being generally glimpses of steps in this change. New species will generally arise from the bifurcation of maxima under circumstances over which man can exercise little control, and which, if he could, he would very likely alter so as either hardly to affect the maximum at all, or too rapidly for the species to shift with it. Selected breeding produces types of less vitality, and therefore will hardly produce new species. Thus the present stability of species is no argument against the doctrine of evolution.

Glasgow

Geological Society, November 30.—Dr. Robert Brown, F.R.G.S., delivered a lecture on "Greenland: Its Physical Geology and Fossil Flora." After alluding to the interest which Greenland possessed, as presenting a picture of what the British Isles were supposed to have been during the glacial period, Dr. Brown gave a graphic sketch of the coast scenery of the country, which he compared to a succession of islands with water on the one side and ice on the other. He described the interior of Greenland as one vast sheet of ice of great thickness, pressing out on all sides to the sea, and occupying as separate glaciers the fiords which indent the coast. These glaciers in many instances push their way out to sea, where portions are broken off and drift away as icebergs; in other cases, the glacier dissolves near the head of the fiord, and great stores of muddy water escaping from it form a deposit of fine clay, which has sometimes silted up part of the fiord so effectually as even to turn the glacier aside into another channel. From what he had observed in Greenland, he was inclined to hold that the lower *till*, or boulder-clay, as it exists in the Forth and Clyde valley, was formed by such a sheet of massive land ice slowly moving over the country, while what he had described as resulting from the waste of the glaciers near the sea might account for some of the well-known beds of laminated clay associated with that deposit. He questioned whether icebergs really did much in the way of conveying rocks or *débris* to any distance. So far as he had observed they bore wonderfully little of such material in or upon them; and he thought that to call in their agency, as had sometimes been done, to account for the dispersion of plants, &c., was highly visionary. Dr. Brown then alluded to the rock-formations of Greenland, and to the plant remains of the Carboniferous and middle Tertiary periods which had been found in the country, showing that it once enjoyed a very different climate from that to which it is now subjected. The Carboniferous plants had only been recently discovered by Dr. Pfaff, and he trusted that gentleman, who was resident on the spot, would be enabled to make further researches.

Paris

Academy of Sciences, December 4.—M. Chasles presented a number of theorems relating to the harmonic axes of geometrical curves, and M. C. Jordan a paper on Gauss's sums with several variables. — M. Tresca read a paper on the effects produced during the planing of metals; and M. H. Resal communicated some investigations on the calculation of the fly-wheels of steam-engines.—Letters were read from Father Secchi on a new method of measuring the heights of the solar protuberances, and on the temperature of the sun. Upon the latter M. Faye made some remarks.—M. Le Verrier presented a note on the shooting stars of the month of November, from observations made in France and Italy. Many meteors issued from the constellation Leo, but the point of radiation was slightly displaced. Five or six currents of meteors in different directions were observed. In August a displacement of the point of radiation was observed between the 9th and 11th.—An extract from a letter from M. J. F. J. Schmidt to M. Delaunay on the November meteors observed at Athens was also read.—M. C. Saint-Claire Deville communicated a note on the early cold weather of 1871, which appears to have prevailed over the whole of France.—M. F. de Biseau recorded the observation of aurora borealis in Belgium on the nights of the 9th and 10th November.—A note from M. de Magnac on the determination by means of chronometers of the differences of longitude of distant places was read.—M. Lecoq de Boisbaudran presented a note on the separation and quantitative determination of some metals by means of a voltaic current.—M. A. Béchamp communicated some observations on a recent note by M. Ritter on the formation of urea by albuminoid materials and permanganate of potash.—M. Wurtz presented a note by M. L. C. de Coppet on a new method of preparing supersaturated saline solutions, in which the author stated that solutions identical with those called supersaturated could be prepared by dissolving certain dehydrated salts (sulphate and carbonate of soda) in cold water.—M. Peligot presented a note by M. T. Schlœsing, containing a comparison of the two conditions of a soil in part wooded and in part cleared and treated with lime.—M. Peligot also presented a note by M. A. Renard on the determination of ground-nut oil in olive oil. The process, which is rather complicated, consists in the saponification of the oil, and the separation from the soap of the arachidic acid which is characteristic of ground-nut oil.—M. Balard communicated a note by MM. Scheurer-Kestner and C. Meunier on the composition and heat of combustion of lignites, containing the analyses and results of combustion of six lignites from various parts of France, and from Bohemia. The heat of combustion was always found to be inferior to that of the carbon and hydrogen contained in the lignites.—M. Elie de Beaumont exhibited a collection of minerals from Bolivia, Chili, and Peru sent by M. Domeyko.—M. S. Meunier presented a note on a new method of obtaining Widmannstätten's figures by attaching a polished plate of meteoric iron to the positive pole of a Bunsen's battery and a plate of silver to the opposite pole, and plunging both into a solution of bisulphate of potash.—M. Husson communicated an analysis of the milk of cows attacked by contagious typhus.—A note was read on the Garumnian type of the department of the Aude, by M. A. Leymerie, in which the author maintains the distinctness of this geological stage, and indicates some of the fossils which characterise it.

BOOKS RECEIVED

English.—Marvels of Pond Life: H. J. Slack (Groombridge and Sons).—The Amateur's Flower Garden: Shirley Hibberd (Groombridge and Sons)—Flowers for Sundays: P. Spenser (Longmans).—The Laws of the Wind prevailing in Western Europe; No. 1, with Charts and Diagrams; W. C. Ley (E. Stanford).

Foreign.—(Through Williams and Norgate.)—Die Axendrehung der Welt-körper: E. F. T. Moldenhauer.

DIARY

THURSDAY, December 14.

Royal Society, at 8.30.—Contributions to the History of Orcin. No. II. Chlorine and Bromine Substitution Compounds of the Orcins; Note on Fuedsol: Dr. Stenhouse, F.R.S.—On some recent Discoveries in Solar Physics; and on a Law regulating the Duration of the Sunspot Period: W. De La Rue, F.R.S., B. Stewart, F.R.S., and B. Loewy.

Mathematical Society, at 8.—On the Celebrated Theorem that every Arithmetical Progression, if it contains more than one must contain an Infinite number of Prime Numbers: J. J. Sylvester, F.R.S.

FRIDAY, December 15.

London Institution, at 4. Elementary Physiology, by Prof. Huxley, F.R.S. No. 7. (Extra Lecture.)

SUNDAY, December 17.

Sunday Lecture Society, at 4.—On the Physiology of Contagion and Infection: Dr. John S. Bristowe.

MONDAY, December 13.

Anthropological Institute, at 8.—The Anthropology of Auguste Comte: Joseph Kaines.—On the Hereditary Transmission of Endowments: George Harris.

London Institution, at 4. No. 8.

TUESDAY, December 19.

Statistical Society, at 7.45.—On the Comparative Health of Seamen and Soldiers: Dr. Balfour.

WEDNESDAY, December 20.

Geological Society, at 8.—Further Remarks on the Relationship of the Limulidæ to the Eurypteridæ and to the Trilobita: Henry Woodward, F.G.S.—Further Notes on the Geology of the neighbourhood of Malaga: M. D. M. d'Orueta.

Royal Society of Literature.—On a capital Joke recorded by Suetonius: Dr. C. Mansfield Ingleby.—On a Collection of Roman Brick Stamps in the Ashmolean Museum at Oxford: Mr. Vaux.

Society of Ats, at 8.—On the Study of Economic Botany, and its Claims Educationally and Commercially Considered: James Collins.

THURSDAY, December 21.

Royal Society, at 8.30.

Linnean Society, at 8.—On the Anatomy of the American King-Crab (*Limulus polyphemus*, Latr.): Prof. Owen, F.R.S.

Chemical Society, at 8.

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